REMARKS

At the outset, the Examiner is thanked for the thorough review and consideration of the pending application. The final Office Action dated March 31, 2010 has been received and its contents carefully reviewed.

By this reply, claims 1 and 7 are amended. Accordingly, claims 1-14 remain pending in this application. No new matter has been entered. Reexamination and reconsideration of the pending claims is respectfully requested.

Claims 1, 3, 4, and 6-14 are rejected under 35 USC 102(e) as being anticipated by U.S. Patent No. 6,535,194 to Hanano (hereinafter "*Hanano*").

Applicant respectfully traverses the rejection and asserts that *Hanano* fails to disclose all the elements necessary to anticipate the claimed subject matter. Specifically, *Hanano* fails to disclose at least "a light shutter on the liquid crystal display panel operable to transmit and shut off a polarized light emitted from the liquid crystal display panel," as recited in claims 1 and 7. Also, Hanano fails to disclose at least "wherein every field period is initiated upon a first transition of a gate signal from a low voltage signal to a high voltage signal to apply grayscale image data to the pixels and is terminated upon a next transition of the gate signal from a low voltage signal to a high voltage signal to apply grayscale image data to the pixel, and wherein every field period corresponds to only one grayscale image data value," as recited in claims 1 and 7. Further, Hanano fails to disclose at least "opening the light shutter at a first transition of the gate signal from a low voltage signal to a high voltage signal," as recited in claims 1, 7 and 13.

As discussed during the interview November 24, 2009, *Hanano* discloses an optical system that creates a 'wobbling or 'vibrating' image with the purpose to improve effective display image resolution or accomplish binocular vision. In addition to a conventional active-matrix liquid crystal display (LCD), *Hanano* discloses two optical elements employed to accomplish image wobbling, a 'TN shutter' (2) and a 'refractor plate' (3) (Figure 1). "The TN shutter 2, the double refractor 3 and the TN shutter drive means 31 constitute a vibrating means" (Col. 13 line 67 - Col. 14 line 2).

The refractor plate, as seen by the viewer, spatially shifts light rays in a predictable manner based on linear polarization of the incident light. Light polarized in a certain orientation incident at a particular point on the rear of the plate will pass through at one position at the front of the plate and, light polarized in a different orientation incident at the same point will pass through at a second position at the front of the plate. Wobbling (or vibration of the optical axis) is accomplished by alternating the polarization of the light incident to the rear of the plate (Col. 10, lines 38-40). As a result, the viewer can effectively see light incident at the same position on the rear of the refractor plate in two different positions at the front of the refractor plate (a pixel shift).

Hanano further discloses the TN shutter located between the LCD and the refractor plate (Figure 1). The shutter converts the polarization state of the linear polarized light emitted from the LCD prior to incidence at the rear of the refractor plate (Col. 1 line 34). "The TN shutter constitutes a polarized light conversion element" (Col. 14 lines 2-3). When electrically switched, "the polarization of the incident light is transmitted while it is rotated by 90 degrees" (Col 1. lines 48-50). The shutter transmits light of one polarization state when electrically OFF, and an orthogonal state when electrically ON.

It is disclosed that linear polarized light is emitted from the LCD [col 11, lines 48-49 stating Crossnicole (sic)]. Wobbling is accomplished by displaying an image originating from the same point at two different locations on the front of the refractor plate. The image location change is accomplished through polarization conversion by the shutter.

The office action points to Figs 4a-4f, element 12, Col. 12 line 49 to Col. 13 line 6 of *Hanano* to anticipate "a light shutter on the liquid crystal display panel operable to transmit and shut off a light emitted from the liquid crystal display panel" as recited in claims 1 and 7. The Applicant respectfully disagrees. This *Hanano* discussion of the second embodiment teaches system timing synchronization between the LCD and the shutter. "Fig 4b shows the transmittance response characteristic of the LCD to the first polarized light" through the shutter as the shutter transitions from one polarizing state to the other during alternate odd and even data fields (Col. 12 lines 52-54). "Actually, however, the TN shutter 2 has response characteristic as described before in connection with FIGS. 31(a) and 31(b)" (Col. 12 lines 30-32).

Similarly, the office action cites *Hanano* Fig 5a where "the shutter is clearly closed/zero transmittance before it is opened" in rejection of claim 13. Applicant again disagrees. "Figure 5 shows a drawing for explaining the transmittance of the TN shutter to the first polarized light" (Col. 9 line 3-4). This is the system result of the timing synchronization method described in relation to Figure 4 with the purpose to increase contrast between Even and Odd fields (Col. 13 lines 25-49). The increased contrast is accomplished by maximizing transmission of one polarized component to one half of the frame (Even Field) while minimizing leakage at the remaining half of the frame (Odd Field) so as not to interfere with the other polarized component.

Details of the shutter characteristics are found in Col. 3 lines 33-52 in describing FIGS 32(a) and 32(b). "However, during the rise time . . . , the second polarized light is also transmitted" (Col. 3 lines 42-43). "Likewise, during the fall response time . . . both the first and second polarized light beams are transmitted" (Col. 3 lines 47-49). In other words, there will always be some leakage of the alternate polarization through the shutter during transitions from one state to another as the relative percentage of the LCD linear polarization components shift. While one polarization component is changing from 0 to 100% during transition, the other is changing from 100 to 0%. At least some light from either or both (during transition) polarization states will be transmitted by the shutter at all times. Therefore, the shutter never actually shuts off light emitted from the LCD and does not read on the present claims.

The Office suggests that Hanano Fig. 5a Even and Odd halves make up a single frame image which is a single image value (OA p. 3, para. 1). However, the Even and Odd halves toggle between a transmittance of 100 % to 0% as shown in Fig. 5. These are not "grayscale images" as recited in independent claims 1, 7, and 13.

In general, when the CRT and the LCD are operated at 60Hz, one field period is approximately 16.7ms corresponding to 1/60 second. The CRT radiates a fluorescent body only during an initial very short time of the one field period to display data while remaining at a pause interval during almost all other portions of the one field period. Accordingly, an observer sees a display image of the CRT similar to a real image without generating a motion-blurring from a moving picture (see FIGs. 1A-1C of the AAPA). On the other hand, in the liquid crystal display, as shown in FIG. 2, data are applied to a liquid crystal in a scanning interval supplied with a gate

high voltage Vgh and data applied to the liquid crystal are maintained in a non-scanning interval that is a major portion of the one field period. Accordingly, the liquid crystal display generates a motion-blurring in a moving picture because each liquid crystal continuously displays an image without a pause interval during the one field period. For eliminating a motion-blurring, the present invention, as independent claims 1, 7 and 13, teaches "the light shutter is opened at a first transition of the gate signal from a low voltage signal to a high voltage signal (in a scanning interval supplied with a gate high voltage Vgh). And the light shutter is closed after the first transition of the gate signal and before the next transition of the gate signal from the low voltage signal to the high voltage signal (in a non-scanning interval)". But, Hanano fails to teach or suggest the feature of the present invention.

As shown in Figs 4a-4g and Col. 12, line 49 to Col. 13, line 49, Hanano discloses "the field detecting circuit 32 generates a field synchronizing signal according to the synchronizing signal from the image display control circuit 11 as shown in Fig. 4c, wherein the field synchronizing signal corresponds to the first transition of the gate signal of the present invention. The delayed signal generating circuits 33 and 34 delay the field synchronizing signal by times t1 and t2, respectively, as shown in Figs 4d and 4e. A TN shutter drive signal is generated by using the output signal of the delayed signal generating circuit 33 as a set signal and the output signal of the delayed signal generating circuit 34 as a reset signal, as shown in Fig. 4f. the TN shutter 2 is opened and closed in syschronism to the TN shutter drive signal as shown in Fig. 4g." Accordingly, **the TN shutter 2 of Hanano is not opened at a first transition of the gate signal from a low voltage signal to a high voltage signal and closed after the first transition of the gate signal and before the next transition of the gate signal from the low voltage signal to the high voltage signal** for eliminating a motion-blurring.

Accordingly, Applicant respectfully submits that claims 1, 7 and 13 are allowable over *Hanano*. Claims 3, 4, 6, 8-12, and 14 which depend directly or indirectly from independent claims 1, 7, and 13 are also allowable for at least the same reasons as discussed above. Therefore, Applicant respectfully requests reconsideration and withdrawal of the 35 U.S.C. § 102(e) rejection of claims 1, 3, 4, and 6-14.

Claims 2 and 5 are rejected under 35 USC 103(a) as being unpatentable over *Hanano* in view of U.S. Patent No. 4,097,128 to Matsumoto (hereafter, "*Matsumoto*").

Applicant respectfully traverses the rejection of claim 2 and 5 and asserts that *Hanano* fails to disclose the included elements as discussed above in relation to claim 1 from which they depend. Further, *Matsumoto* fails to cure the deficiencies of *Hanano* discussed above.

Thus, claim 1 recites patentable subject matter. Applicants respectfully submit that at least claims 2 and 5 are allowable by virtue of their dependency from independent claim 1. Therefore, Applicant respectfully requests reconsideration and withdrawal of the 35 U.S.C. § 103(a) rejection of claims 2 and 5.

Applicants believe the foregoing amendment and remarks place the application in condition for allowance and early, favorable action is respectfully solicited.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at (202) 496-7500 to discuss the steps necessary for placing the application in condition for allowance. All correspondence should continue to be sent to the below-listed address.

If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 C.F.R. §1.136, and any additional fees required under 37 C.F.R. §1.136 for any necessary extension of time, or any other fees required to complete the filing of this response, may be charged to Deposit Account No. 50-0911. Please credit any overpayment to deposit Account No. 50-0911.

Dated: June 30, 2010

Respectfully submitted,

By: */Eric J. Nuss/*_____
Eric J. Nuss
Registration No.: 40,106
McKENNA LONG & ALDRIDGE LLP
1900 K Street, N.W.
Washington, DC 20006
(202) 496-7500
Attorneys for Applicant